

Maine Department of Transportation

Highway Program

Design Guidance

Title: Critical Length of Grade and Climbing Lanes

Issue Date: 12/15/2021

Discipline: General Engineering

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Background:

The term “critical length of grade” is used to indicate the maximum length of a designated grade on which a loaded truck can operate without an unreasonable reduction in speed. For a given length of grade, lengths less than critical result in acceptable operation in the desired range of speeds. If the desired freedom of operation is to be maintained on grades longer than critical, design adjustments such as changes in location to reduce grades or addition of extra lanes are possible alternatives. Climbing lanes are used to allow passing of slower moving vehicles.

Guidance:

As the vertical design is evaluated for new construction projects, critical length of grade shall be considered in the determination of need for climbing lanes. For all other projects, the Bureau of Planning or the Office of Safety and Mobility will identify issues and concerns related to critical length of grade and the need for climbing lanes and it will be a part of the Project Scope. If critical length of grade and climbing lanes are to be addressed as part of the Project Scope, the methodology presented in AASHTO Chapter 3, Section 3.4 Vertical Alignment shall be used. Sound engineering judgement shall be used to determine the superelevation for the climbing lane based on potential impacts.